

## Creating a Worldview and Permissive Microenvironment for Translational Sciences

ANANTHA SHEKHAR, M.D., PH.D.

**B**ioomedical research, as the term suggests, has always been engaged in fundamental biological discoveries that lead to practical applications into human health as its final goal. Over the last decades much has been written about the rapid transformation of basic sciences, yet the progression and implementation of these new ideas into the marketplace continues to occur at a glacial pace. To overcome this “translational” gap, there have been calls for new methodologies, new mechanisms of funding research, and the need to create multidisciplinary research teams with expertise in “translational sciences.” This has resulted in the establishment the National Center for Advancing Translational Sciences (NCATS) within the National Institutes of Health, and funding of 61 Clinical and Translational Science Awards (CTSAs) to establish “integrated homes” across academic medical centers for translational research.

Partly due to increasing societal and consumer demands and tightening funding constraints, there is now clear emphasis on translational research in all areas of biomedical research. Such a paradigm change has forced academic research establishments into rethinking about institutional resources, efficiency of processes, and wholesale transformation of institutional environments to foster translational research. However, this is not a simple or linear process that can be easily accomplished within academic environments. For example, the series of translational steps that take a small molecule to market are quite distinct from similar steps required to take a device to patients, which is yet different from the steps that make effective implementation of a practice innovation into the broader community possible. Also, since translating fundamental discoveries into practice involves a series of complex scientific, regulatory, commercial, and financial steps, and a coordinated activity of a wide range of experts working in teams, it has created a need for establishing a systematic field of knowledge.

Despite this increased emphasis on translation, the formal field of “translational sciences” is still relatively recent and evolving. Also, the term translational sciences is a field that has started to take on somewhat differing meanings to groups engaged in moving different types of discoveries into practice, and has created significant confusion in its practitioners, leading to fragmentation of efforts to advance its mission. This problem is particularly acute when it comes to training young investigators and students, i.e., the translational research workforce of the future. Thus, a clear and immediate task from the point of view of the Association of Clinical Translational Sciences (ACTS) is to clearly define a comprehensive “worldview” of translational sciences and catalogue its diverse practitioners and stakeholders for inclusion into its broad tent. Such an effort would not only help develop unique programs within ACTS and other biomedical research societies, provide career development resources for future practitioners, streamline advocacy for translational research

through multiple stakeholders, and also increase the readership and contributor base for the CTS and similar journals. Therefore, the leadership of ACTS is rolling out a series of strategic planning sessions, focus group meetings, and broad surveys to better define the field “translational sciences” and its “membership” over the next few months.

While there is general acceptance of the need to transform our research processes and training of future researchers, there are still many challenges to making these transformations at the level of individual academic medical centers. The majority of the research faculty at academic medical centers, although very interested in and willing to embrace translational research, are housed in environments where they are recognized for being experts in very focused areas of discovery and supported by traditional R01 grant mechanisms which put a premium on deep expertise. The institutional success metrics (publications, recognition by societies, invitations to panels, etc.) further keep them discouraged from deviating from the current model. Academic researchers need a “permissive” local habitat for translational research, and much of this responsibility falls on university and academic center leadership where there is a paucity of best practices to guide the leadership. Local transformation will need an institutional “microenvironment” that will not kill such efforts with disincentives based on rigid systems of reward, promotion, and tenure processes.

One approach that is being explored by some institutions is populating increasing numbers of “clinician-scientists” who could create a fulcrum of change within clinical departments, and begin to bridge collaborations with basic science departments. Increasing such “cross-cutting” faculty group will naturally create a tipping point when rapid cultural transformation can occur. I am familiar with one great example of such an effort with the Physician-Scientist Initiative (PSI) being implemented at Indiana University. The PSI program was funded by a \$60 million grant from the Lilly Endowment under the leadership of the dean of the school of medicine, and managed by committee of translational research leaders that is chaired by the executive associate dean for research. The initiative provides start-up and recruitment dollars to any clinical department that is interested in bringing in clinician-scientists, defined broadly as those with clinical training who devote substantive effort to research anywhere along the entire spectrum of biomedical inquiry, ranging from basic sciences to patient outcomes and policy. The requirements are that such faculty need to be dually recruited with a basic science department, and are incentivized upon arrival to create new cross-disciplinary research programs and grants. The program has been extremely popular with clinical department chairs and has so far recruited nearly 20 such researchers. It has created new programs ranging from bone biology, cancer therapeutics,

cardiac genetics, and pediatric intensive care to biomedical informatics, all engaging basic science departments ranging from anatomy to computer sciences. While the long-term benefits of the PSI program are still being evaluated, it has already created a culture of communication, collaboration, and mutual respect and dependence between the clinical and basic sciences faculty that is new and exciting.

---

I believe, for “translational sciences” to permanently take root within academic medical centers, we need to make an all-out effort to changing our institutional microenvironments that complement the efforts at the national level by agencies like the NIH and NCATs, and societies like ACTS. Investing for the future should include a focus on developing a new generation of clinician scientists that are able to lead these initiatives. **CTS**